LA-UR-21-27803
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Title:	End of Summer Presentation
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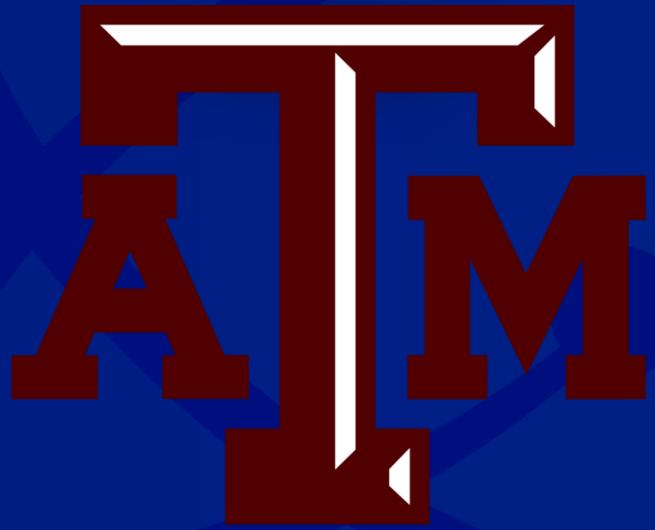
Intended for:	To keep in my academic portfolio
Issued:	2021-08-04

Los Alamos NATIONAL LABORATORY

End of Summer Presentation Summer 2021

Diego Martinez

August 4th



LA-UR: - pending

Overview

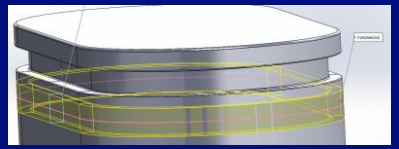
Background

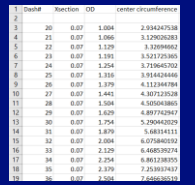
Training

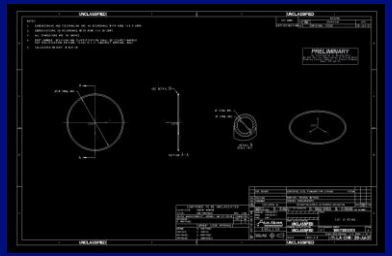
Project

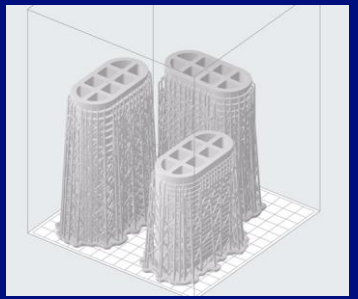
Contributions

What I Learned



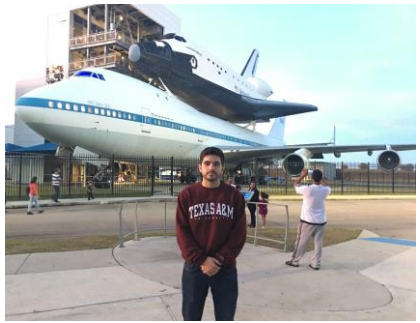






Background

- Originally from Spain
- Lived in England and Mexico
- High school in Houston, Texas

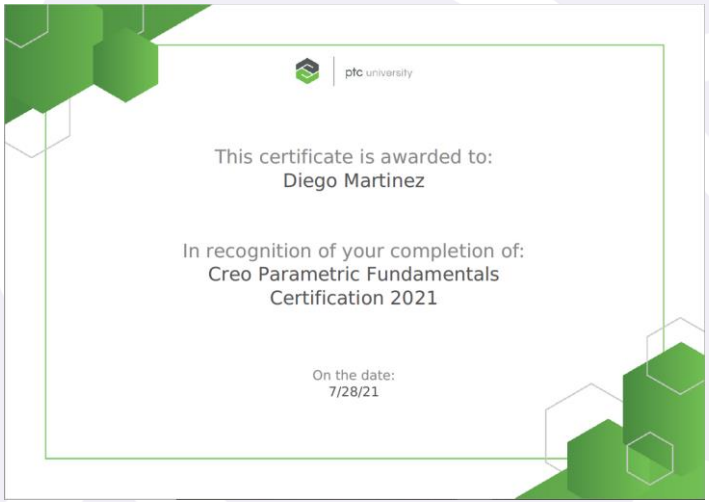


- Interests:
  - Astrophysics
  - Drone cinematography

- Texas A&M – Class of 2022
- Mechanical Engineering

Training

GD&T Levels 1,2 and Advisor

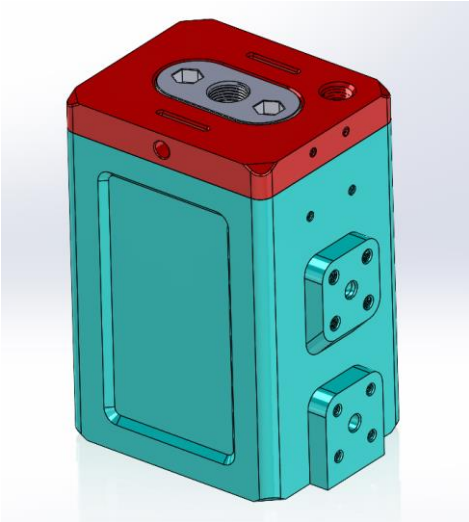


Creo Parametric Fundamentals

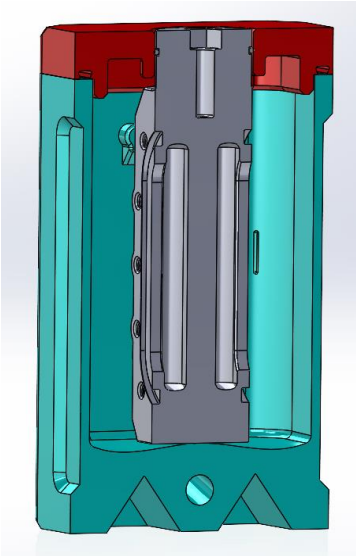
Project

Decontaminating Gloveboxes

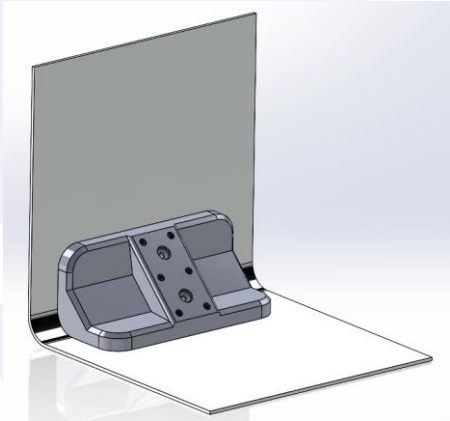
Project



[Electrolytic] Flowcell

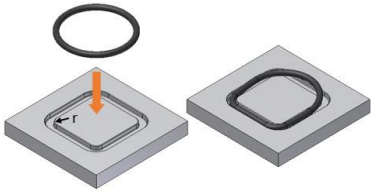


Cathode/Anode

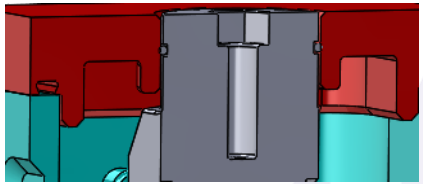


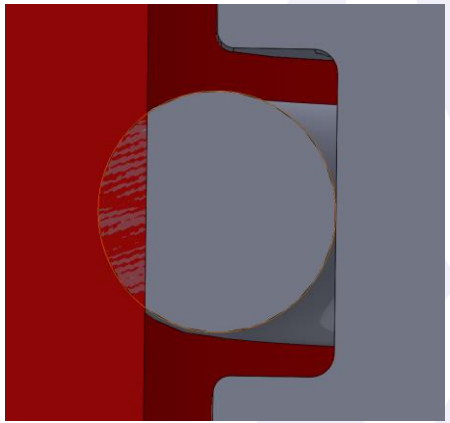
Edge Vacuum Head

Contributions

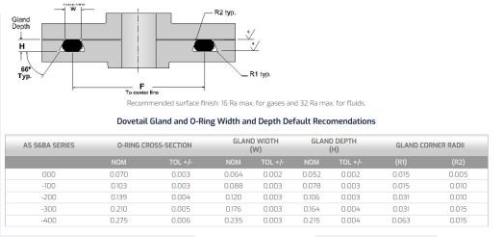


Non-circular o-ring groove





Overlap/Squeeze



Recommended surface finish: 16 Ra max. for gases and 32 Ra max. for fluids.

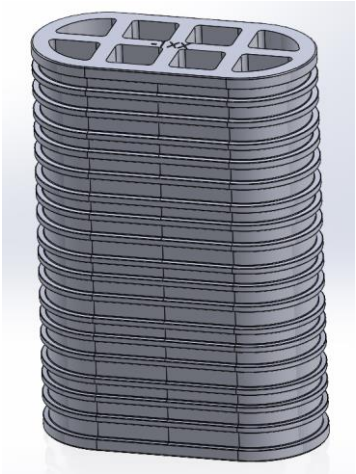
Dovetail Gland and O-Ring Width and Depth Default Recomendations

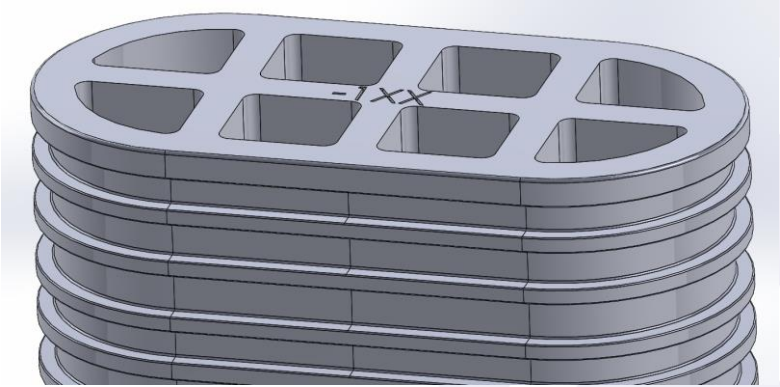
AS 568A SERIES	O-RING CROSS-SECTION		GLAND WIDTH (W)		GLAND DEPTH (H)		GLAND CORNER RADII	
	NOM	TOL +/-	NOM	TOL +/-	NOM	TOL +/-	(R1)	(R2)
-000	0.070	0.003	0.094	0.002	0.052	0.002	0.015	0.005
-100	0.103	0.003	0.088	0.003	0.078	0.003	0.015	0.010
-200	0.139	0.004	0.120	0.003	0.106	0.003	0.031	0.010
-300	0.210	0.005	0.176	0.003	0.164	0.004	0.031	0.015
-400	0.275	0.006	0.235	0.003	0.215	0.004	0.063	0.015

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Dash#	Xsection	OD	center circumference			o ring circumference requirement	squeeze		depth	squeeze	oring offset	width
2						0XX	6.8714598	0		0.0475	0.0025	0.0125	0.0865
3	20	0.07	1.004	2.934247538		1XX	6.672964263	0.002		0.0455	0.0045	0.0105	0.0885
4	21	0.07	1.066	3.129026283		2XX	6.597566039	0.008		0.0435	0.0065	0.0085	0.0905
5	22	0.07	1.129	3.32694662						0.0415	0.0085	0.0065	0.0925
6	23	0.07	1.191	3.521725365						0.0395	0.0105	0.0045	0.0945
7	24	0.07	1.254	3.719645702						0.0375	0.0125	0.0025	0.0965
8	25	0.07	1.316	3.914424446						0.0355	0.0145	0.0005	0.1014
9	26	0.07	1.379	4.112344784						0.0335	0.0165	-0.0015	0.1038
10	27	0.07	1.441	4.307123528						0.0315	0.0185	-0.0035	0.1062
11	28	0.07	1.504	4.505043865						0.0295	0.0205	-0.0055	0.1086
12	29	0.07	1.629	4.897742947						0.0275	0.0225	-0.0075	0.111
13	30	0.07	1.754	5.290442029						0.0255	0.0245	-0.0095	0.1134
14	31	0.07	1.879	5.68314111									
15	32	0.07	2.004	6.075840192						0.0675	0.0155	0.016	0.1606
16	33	0.07	2.129	6.468539274						0.0655	0.0175	0.014	0.163
17	34	0.07	2.254	6.861238355						0.0635	0.0195	0.012	0.1654
18	35	0.07	2.379	7.253937437						0.0615	0.0215	0.01	0.1678
19	36	0.07	2.504	7.646636519						0.0595	0.0235	0.008	0.1702
20	37	0.07	2.629	8.039335601						0.0575	0.0255	0.006	0.1726
21	38	0.07	2.754	8.432034682									
22										0.1	0.019	0.0305	0.2118
23										0.097	0.022	0.0275	0.2154
24	117	0.103	1.005	2.833716574						0.094	0.025	0.0245	0.219
25	118	0.103	1.068	3.031636911						0.091	0.028	0.0215	0.2226
26	119	0.103	1.13	3.226415655						0.088	0.031	0.0185	0.2262
27	120	0.103	1.193	3.424335992						0.085	0.034	0.0155	0.2298
28	121	0.103	1.255	3.619114737									
29	122	0.103	1.318	3.817035074									
30	123	0.103	1.38	4.011813819									
31	124	0.103	1.443	4.209734156									
32	125	0.103	1.505	4.4045129									
33	126	0.103	1.568	4.602433238									
34	127	0.103	1.63	4.797211982									
35	128	0.103	1.693	4.995132319									
36	129	0.103	1.755	5.189911064									
37	130	0.103	1.818	5.387831401									
38	131	0.103	1.88	5.582610145									
39	132	0.103	1.943	5.780530483									
40	133	0.103	2.005	5.975309227									
41	134	0.103	2.068	6.173229564									

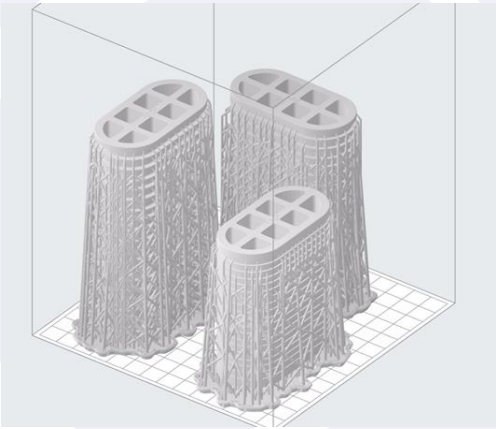
Contributions

Testing multiple grooves on a single part



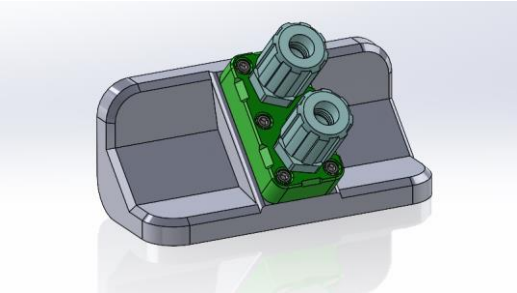


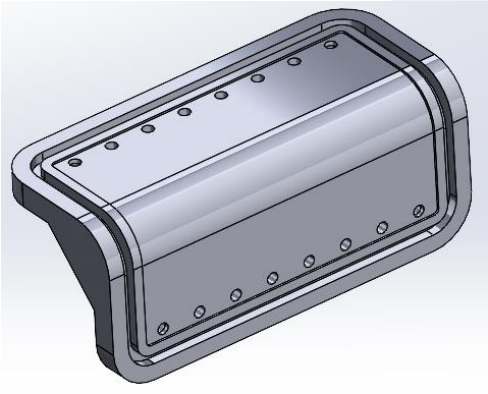
3D printing prototypes



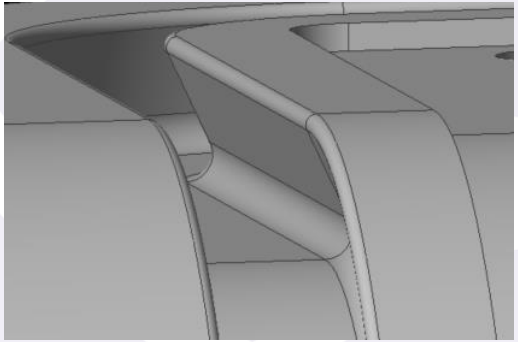
Contributions

90 degree airtight surface





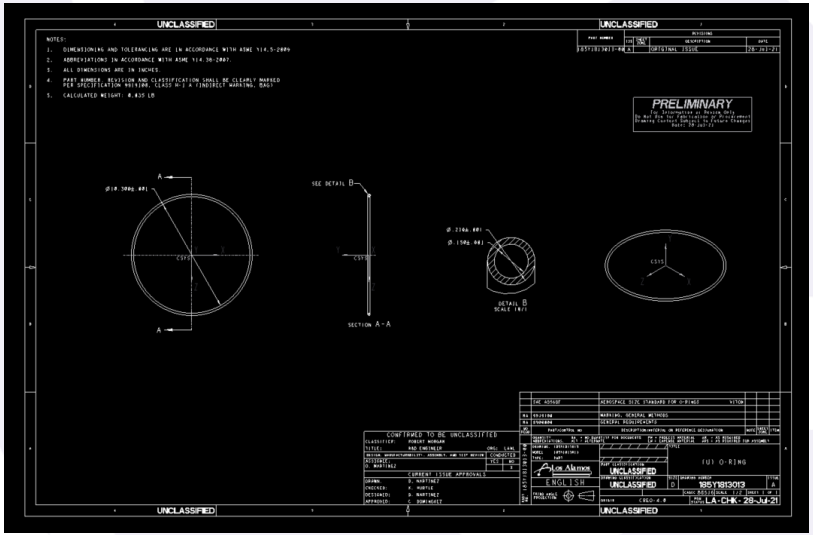
Dovetail groove



Contributions

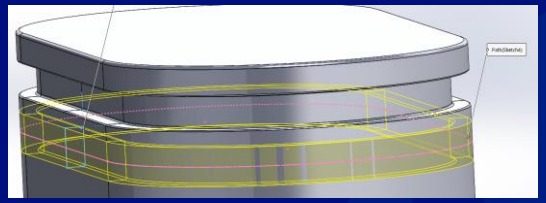
Custom rubber extrusion

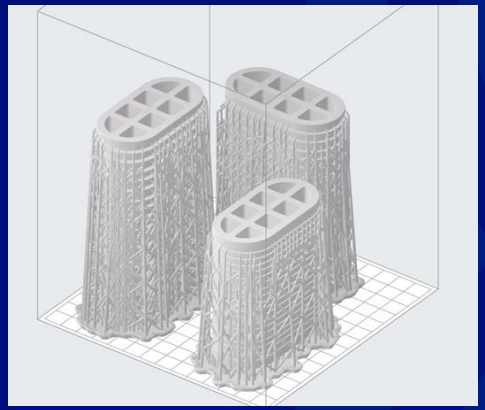
Final o-ring technical drawing



What I learned

- Swept Cut
- Technical Standards
- Excel for CAD
- Manufacturing
- O-Ring Sealing
- Design Meetings
- W-11 Drawing/Windchill





	Dash#	Xsection	OD	center circumference
1				
2				
3	20	0.07	1.004	2.934247538
4	21	0.07	1.066	3.129026283
5	22	0.07	1.129	3.32694662
6	23	0.07	1.191	3.521725365
7	24	0.07	1.254	3.719645702
8	25	0.07	1.316	3.914424446
9	26	0.07	1.379	4.112344784
10	27	0.07	1.441	4.307123528
11	28	0.07	1.504	4.505043865
12	29	0.07	1.629	4.897742947
13	30	0.07	1.754	5.290442029
14	31	0.07	1.879	5.68314111
15	32	0.07	2.004	6.075840192
16	33	0.07	2.129	6.468539274
17	34	0.07	2.254	6.861238355
18	35	0.07	2.379	7.253937437
19	36	0.07	2.504	7.646636519
20	37	0.07	2.629	8.039335601
21	38	0.07	2.754	8.432034682
22				
23				
24	117	0.103	1.005	2.833716574
25	118	0.103	1.068	3.031636911
26	119	0.103	1.13	3.226415655
27	120	0.103	1.193	3.424335992
28	121	0.103	1.255	3.619114737
29	122	0.103	1.318	3.817035074
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